MASTER'S THESIS

The Role of Enterprise Architecture Artifacts in Strategic Planning for Digital Transformation

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The Role of Enterprise Architecture Artifacts in Strategic Planning for Digital Transformation

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DECLARATION

I have carefully read and understood the definitions of fraud and plagiarism. I, as a result of this, declare that the assignment mentioned above is entirely my work, and I have not been guilty of plagiarism.

Antwerp, 20/08/2020

Michael Enegide

ABSTRACT

Organizations are continually improving their services and innovating to meet the ever-changing market demand and competition. Digital transformation is the newest technology-driven change in customer behavior. However, planning and steering can become complicated as the organization grows. Enterprise Architecture is an approach used to manage the complexity and alignment between business and IT goals. EA practice involves creating different artifacts used to describe the various aspect of the organization and to facilitate information systems planning. The thesis aims to investigate the role of EA artifacts in the strategic planning process for digital transformation.

This study applied a multiple phases approach. Firstly, I used a literature review to explore the existing literature for information and gaps, followed by an in-depth qualitative case study.

The findings show there are internal and external stakeholders that influence the strategic planning process. The organization does not use frameworks to organize EA artifacts. EA artifacts are consulted regularly during the decision and implementation phases in the strategic planning process for digitalization. Also, the EA integrate into routine business processes.

This research contributes to the EA discipline by providing researchers, scholars, and practitioners with an in-depth understanding of the role of EA artifacts in EA practice.

***Keywords**: enterprise architect, artifacts, role, strategic planning, digital transformation, qualitative research*

SUMMARY

This graduation thesis aims to gain a deep understanding of the role of EA artifacts used by different stakeholders in the strategic planning process for digital transformation.

EA artifacts describe various aspects of an organization and to facilitate information systems planning. An insufficient understanding of individual EA artifacts, their practical usage, maintenance, purposes, and roles in the context of an EA practice is a significant gap in EA discipline. For this reason, I decided to investigate the role of EA artifacts used in the strategic planning process, and the stakeholders involved aimed to facilitate digital transformation.

In the first phase of the empirical study, a systematic literature review is chosen as the research method to explore the existing literature for information and gaps. The findings presented the EA artifacts from the literature review as business function development plan, conceptual data model, enterprise portfolio, high-level operational concept, impact and risk assessment, operating model, principles & guidelines, security & privacy plan, stakeholder communication plan, strategic plan, SWOT analysis, technology & skills forecast, technology standards, governance structure, services and products. The stakeholders involved in the strategic planning process are architects, project managers/ members, IT organization, EA support stakeholders, senior business leaders, planning managers. A clear view on which artifacts used by whom and for what purposes are not fully defined, which leads to further investigation of the topic.

In the second phase of the empirical study (qualitative case study) to deepen our understanding of the role of EA artifacts in a real environment, an interview is the research approach. Firstly, I conducted semi-structured interviews with five senior executive managers (business and IT) involved in the strategic planning process to capture their insight on the role of EA artifact in EA practice. Afterward, EA archival documents were collected and analyzed. The interviews were recorded and transcribed from voice to text document using Google Cloud and VB audio virtual software. I did the coding (open) on an Excel spreadsheet. I used the pattern matching method for data analysis. The EA artifacts found in the case organization as follows: Enterprise portfolio, Impact and risk assessment, Principles & guidelines, Security & privacy plan, Stakeholder communication plan, Strategic plan, SWOT analysis, Governance structure, Services and products. The stakeholders that use these artifacts are grouped into internal and external stakeholders from different partners, with each having two or more representatives. The stakeholders are as follows: senior IT managers, support managers, project managers, IT supply organization, coordinators, ICT directors, IT managers, communication director, Front- and Back Office directors, medical director, architects. The case organization provided not all EA artifacts for analysis due to privacy concerns.

The study findings present a list of EA artifacts used and for what purposes. For example, the use of reports and manuals to carry out updates, roll out new services and products, but also as instructions for users. The use of SWOT analysis to analyze the organization's present state and what the organization wants to achieve. Organizations use Cognos Analytics for reporting, analytics, balanced scorecard, and monitoring. These documents are most useful during the roll-out of new projects and the implementation of a plan for digitalization. Technology plays a significant role in providing digital services for the case organization. EA framework is a taxonomy for organizing artifacts. However, the case organization does not use a framework to structure EA artifacts. The stakeholders involved are representatives from partner

organizations (internally and externally). In line with the previous studies, the research shows that the concept of EA as a blueprint might be distant from real practice. For example, EA practice is described hardly as a single stepwise approach to the role of using different EA artifacts, but rather as different business processes that revolve around specific interrelated EA artifacts.

This study has some limitations: the chance of potential subjectivity by reflecting on the views of respondents, the absence of some documents, and the lack of some senior executive managers' contribution.

In light of these new findings, the following recommendations for best practice on the role of EA artifacts in EA practice are:

Firstly, business capability models and roadmaps could provide some high-level descriptions of the organization since both represent long-term goals for the business and IT.

Secondly, EA practice is described hardly as a single stepwise approach to the role using different EA artifacts, but rather as different processes that revolve around specific interrelated EA artifacts.

Thirdly, different EA artifacts play a different role in terms of a user case.

Fourthly, different roles of EA artifacts require various stakeholders, which are strongly associated with their intended usage and purpose.

Fifthly, the need to consider the influence of different partners on the roles of EA artifacts in the context of an EA practice.

Lastly, Fast IT can transform business value from any perspective and give it a backbone.

The findings show that technology is a significant factor in creating digital world services in health insurance funds. The qualitative research provides new insight into the role of EA artifacts as follows: EA artifacts are consulted as needed and contribute to a different aspect of EA practice like decision making, planning, deciding what technology to implement. There are internal as well as external stakeholders involved in the strategic planning process, which plays an essential role in digitalization. Fast IT can transform business value from any perspective. CIO's, business users, and even technology vendors (Cloud, mobility, and big data) can take hold of the traditional model of IT service and give it a backbone. Thus, further research should investigate how the artifacts found in the case organization could apply to other sectors. Further research should investigate the role of artifacts from a broader perspective. Also, further research should investigate the benefits but also the risk of using new digital technologies/ fast IT in an organization.

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ABBREVIATIONS

EA	Enterprise architecture
EAM	Enterprise Architecture Management
ICT	Information and Communication Technology
IT	Information Technology
TOGAF	The Open Group Architecture Framework
RQ	Research Questions
SLR	Systematic Literature Review
DT	Digital Technology
DTS	Digital Technology Strategy
IS	Information System
SMACIT	Social, Mobile, Analytics, Cloud, Internet of Things
ADM	Architecture Development Method
CIO	Chief Information Officer
CEO	Chief Executive Officer
EAP	Enterprise Architecture Planning
EAA	Enterprise Architecture Artifacts

1. INTRODUCTION

1.1. Background

Digital transformation is the newest trend in business transformation, having IT both as a technology enabler and as a strategic driver (Hendrickx, 2015). The new digital technologies can present great opportunities but also threats to successful companies built in the pre-digital economy (Sebastian et al., 2017). For companies to maintain their competitiveness, they need to take advantage of both their existing strengths and the capabilities offered by digital technologies (Sebastian et al., 2017). Enterprise Architecture (EA) is an approach used to provide insight and overview to manage the complexity in organizations and to aid strategic decision making (Op't Land, Proper, Waage, Cloo, & Steghuis, 2009). EA practice involves developing and using specific EA documents to facilitate information systems planning (Kotusev, 2017, p.2).

Strategic planning is an unstructured continuous process tightly integrated into general management strategic activities, e.g., environmental analysis, identifying competitive advantages, and goals formation (Kotusev, 2019, p.2). There are three phases in the strategic planning process: formulation, implementation, and evaluation (Simon, Fischbach, & Schoder, 2013). EA is most valuable in the strategy formulation and implementation phases when a company assesses its readiness for transformation and decides on how to execute the chosen strategy (Simon, Fischbach, & Schoder, 2013).

IT staff uses EA since it provides actionable guidance for implementing the necessary information systems and transforming an organization to the desired target state (TOGAF, 2011; Bernard, 2012). Executives, managers, and many other stakeholders also use EA for communication, analysis, and decision-making. (TOGAF, 2011; Bernard, 2012; Armour et al., 1999).

1.2. Exploration of the topic

To have a clear understanding of EA practices and artifacts, we look at definitions of EA retrieved from existing literature and journal articles.

Enterprise Architecture: "a description of an enterprise from an integrated business and IT perspective intended to improve business and IT alignment (Kotusev, 2015; Bradley et al., 2011; Tamm et al., 2011)."

Enterprise Architecture Management (EAM) describes the current state of the EA and to develop a strategy to transform it into the desired future state or to contribute to fundamental organizational changes (Labusch, Aier, Rothenberger, & Winter, 2014b; Labusch, Koebele, Aier, & Winter, 2013).

The use of digital technologies like SMACIT (social, mobile, analytics, Cloud, and Internet of things [IoT]) can present great opportunities for established companies by offering new compelling value propositions, especially by combining their existing competencies with new digital capabilities (Ross et al., 2016, p.3). A two-speed IT architecture will help companies develop their customer capabilities at high speed while lowering the release pace cycles of new functionality (Bossert, Ip, & Laartz, 2016).

EA artifacts describe various aspects of EA (Abraham, 2013; Winter & Fischer, 2006; Niemi & Pekkola, 2019; Kotusev, 2015b, p.2). EA artifacts include text documents, manuals, guides, technical reference material, graphics, drawings, pictures, raw data, information, presentations, spreadsheets, and videos

(Bernard, 2012). EA framework is a taxonomy for organizing the EA artifacts (Winter & Fischer, 2006). The frameworks guiding the design of artifacts often cover business, information, application, and infrastructure technology architectures (Dube & Dixit, 2011; Bernard, 2012; TOGAF, 2018).

A strategic plan requires various EA's at different points in time of EA transformations, which, in turn, would benefit from the previous knowledge of the products and services to be supported (Lankhorst, 2013). Despite the different advice on the benefits of EA in the existing literature, EA has a low success rate of its initiative (Löhe & Legner, 2014; Kotusev, 2015; Roth et al., 2013).

1.3. Problem statement

A significant gap in the EA discipline is due to insufficient understanding of individual EA artifacts, their practical usage, maintenance, purposes, and roles in the context of an EA practice (Niemi & Pekkola, 2019; Kotusev, 2015).

EA programs regularly encounter different challenges and are confronted with several typical problems (Kaisler et al., 2005; Seppanen et al., 2009; Löhe & Legner, 2014). For example:

- Substantial financial, human, and time resources are necessary to develop EA artifacts (Seppanen et al., 2009).
- After developing a comprehensive set of EA artifacts, these EA artifacts are often not used actively or even found to be mostly useless for decision-making purposes (Carvalho & Sousa, 2014; Kappelman, 2010).
- EA programs are known for "living" in a separate reality from the rest of the organization and eventually ending up in "ivory towers" (Ambler, 2010; van der Raadt et al., 2010).

The lack of focus on business architecture indicates a gap between EA and strategic planning (Blomqvist, Halén, & Helenius, 2015, p.43). Therefore, an explicit link between strategic planning and EA is desirable (Lankhorst, 2013). Today, successful EA practices never follow the steps of TOGAF, ADM, EAP, or any other similar models, even in the organizations included in the "official" list of TOGAF users provided by The Open Group (Kotusev, 2019, p.1).

There are limited studies on the role of EA artifacts for digital transformation and a deepening in the strategic planning process and associated stakeholders (other than EA specialists) to provide a better understanding of the role of EA artifacts in EA practice.

1.4. Research objective and questions

Reflecting on the problem statement above, the purpose of this research is to gain a deep understanding of the role of EA artifacts used by different stakeholders in the strategic planning process for digital transformation. Based on the research objective, the main research questions (RQ's) is:

RQ: *Which EA artifacts are used by which stakeholders to facilitate the strategic planning process for digital transformation?*

The following sub-research questions (SRQ's) answer the research question:

(1) Which EA artifacts exist in the strategic planning process for digital transformation?

(2) Which stakeholders benefit from the use of EA artifacts in the strategic planning process?

1.5. Motivation/ relevance

Kotusev (2018) suggests that the understanding of EA artifacts, roles, and benefits can alleviate the significant problems with EA practice. Thereby, increase the success rate of the EA initiative (Kotusev, 2018). The research findings would offer a deep understanding of the role of EA artifacts used in the strategic planning process, and the stakeholders involved aimed to facilitate digital transformation. Thereby contributing to researchers, scholars, and practitioners' understanding of the role of EA artifacts.

1.6. Thesis Outline

This thesis follows multiple stages approach given below as follows:

- Chapter 1 introduces the research topic with definitions of key concepts, problem statement, research questions, and objectives of the study.
- Chapter 2 explore the problem analysis further by searching the existing literature for knowledge that is already available.
- Chapter 3 discusses the overall empirical research design and strategy, data collection, and data analysis procedures.
- Chapter 4 discusses the outcomes of qualitative research.
- Chapter 5 discusses the findings of empirical research, limitations, contributions, and recommendations for further research.

2. Theoretical framework

2.1. Research approach

In this first phase of the empirical study, a systematic literature review (SLR) is the research approach due to the nature of this research (exploratory). "SLR is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing literature and recorded works by researchers, scholars, and practitioners (Fink, 2005, p. 3)." Non-scientific literature (like Gartner, Forester, CIO-magazine) are not considered in the review because the results are not reproducible, could be biased, and the use of non-scientific techniques. The literature review follows eight significant steps (see appendix A) that one needs to take to conduct a systematic literature review to be scientifically rigorous (Okoli & Schabram, 2010) substantiated in subsequent sections.

2.2. Implementation

2.2.1. Purpose

The purpose of the literature review is to explore the existing literature for information and gaps about the problem statement (see section 1.3) to provide answers to the sub-research questions SRQ's (see section 1.4).

2.2.2. Protocol and team training

For reviews with more than one reviewer, reviewers need to be completely clear and in agreement about the procedure to follow, which requires both a written, detailed protocol document and training for all reviewers to ensure consistency in how to execute the review (Okoli, 2015, p. 43). That does not apply to this study since it is a standalone review. However, in the previous chapter, the RQ's were formulated (see section 1.4). In this section, I used a systematic literature review approach, as suggested by Okoli & Schabram (2010), to provide analysis and synthesis of the existing literature. The inclusion and exclusion criteria used in subsequent sections are formulated based on the RQ's, as suggested by Kitchenham & Charters (2007). I cross-checked vital concepts and research queries with the thesis supervisor. In Chapter 5, I use the findings for comparison and analysis.

2.2.3. Practical screening

It is important to define quality criteria to meet the requirement of completeness and, also, the explicit formulation of the criteria to ensure that the study is reproducible (Fink, 2005, p.3). I formulated the inclusion criteria below to ensure completeness and to keep the review practically manageable, as suggested by Okoli (2015). Papers included are papers that conform to the following criteria:

(1) Papers with a focus on EA artifacts
(2) Journal articles, conference papers, book chapters, and technical papers
(3) Studies in English
(4) Peer-reviewed articles from 2010 up to date to limit the risk that the articles are already outdated or obsolete.

2.2.4. Literature search

The key concepts and search strings identified from the RQ's are:

'EA artifact,' 'EA document,' 'enterprise architecture,' 'enterprise architect,' 'strategic planning process,' 'digital transformation.' I searched for the existing literature (title, abstract, citing). I cross-checked the reference lists using the forward snowballing method, as suggested by Webster & Watson (2002), to ensure no papers are left out. The research queries and sources used are as follows:

Research queries:

("artifacts" OR "document*") AND ("enterprise architecture*") AND ("strategic planning process")*

("artifact" OR "document*") AND ("enterprise architect*") AND ("digital transformation")*

Research sources:

- *Google Scholar (www.scholar.google.com)*
- *Open University Electronic Library (https://bibliotheek.ou.nl/)*
- *Papers provided by Open University*

The search resulted in *479* hits retrieved from Google Scholar, Open University, and Open University Electronic Library. The use of multiple databases allows for broader coverage. However, it may result in a large number of duplicate studies that will have to be manually removed (Wohlin, Runeson & Höst, 2012).

2.2.5. Quality appraisal

After the initial search, read the abstract, key concepts, and content. I screened the papers using the defined exclusion criteria below, as suggested by Kitchenham & Charters (2007). After identifying the relevant articles, I found *Thirty-four* candidate papers. Papers excluded are papers that conform to the following exclusion criteria:

(1) Documents that are not related to the research questions
(2) Short papers
(3) Duplicate studies
(4) Papers not in English

2.2.6. Data extraction and synthesis

I read the full text in detail, analyzed the data, which resulted in *eleven* papers relevant to the RQ's (see appendix B). For each article, I recorded their bibliographical information (author and year of publication), personal summary, research methods, and content-specific issues, such as the results of the study using a literature synthesis matrix (see Appendix C).

2.3. Results and conclusions

2.3.1. Results

The insights synthesized from the systematic literature review (see appendix C) to answer the sub-research questions (SRQ's) are:

SRQ1: Which EA artifacts exist in the strategic planning process for digital transformation?

The EA artifacts developed during the strategic planning process are mission and vision statements, scenarios, strategies, goals, and initiative measures (Bernard, 2012, p.85). Based on Kotusev (2019), the strategic planning process revolves around Considerations (e.g., principles and policies) and Visions (e.g., business capability models and roadmaps). TOGAF (2011) classifies artifacts into catalogs (lists of things), matrices (showing relationships between elements), and diagrams (pictures of things). The table below (Table 2.1) shows a proposed list of EA artifacts deducted from the literature review.

EA artifacts	**Description**	**Article (authors)**
Mission Statement	The mission statement describes the purpose and direction of the enterprise. The Mission Statement answers the "who are we" question at the level of the entire enterprise.	Bernard (2012)
Vision Statement	Vision statements describe in abbreviated form the competitive strategy of the enterprise. The Vision Statement answers the "how are we getting there?" question at the level of the entire enterprise.	
SWOT analysis/ Scenarios	A scenario describes the coordination of ongoing activities of the business, as well as several future occurrences for both internal and external drivers identified through the SWOT Analysis.	
Strategic Plan	This area of the Strategic Plan identifies how the enterprise will achieve success in pursuing its stated strategic direction done at two levels. First, a general strategy related to growth, and second, a more specific strategy related to competition or differentiation.	
Strategic Goals	The enterprise's strategic goals are objectives achieved together. That ensures survival and to attain success as defined in the outcome measures and performance metrics that the enterprise develops for itself.	
Initiatives Measures	By identifying goals and initiatives that can be measured, the enterprise can manage these activities.	
Business models	Describe primary organizational functions, sub-functions, and organizational units performing them.	Blomqvist (2015)
Policies	Describe sets of related standards, principles, and guidelines relevant to a particular area of interest.	Kotusev (2018), (2019)
Business Capability Models	BCM is used to serve as a "heatmap" for the ICT steering committee and facilitate investment decisions.	
Roadmaps	Roadmaps facilitate engagement between managers and business customers about the needs for new IT projects.	
Consideration and Visions	Considerations are business-focused Rules, and Visions are business-focused Structures.	
Principles	Principles are brief reusable implementation-level rules applicable to broad categories of projects.	Kotusev (2018), TOGAF (2011)

Matrices	The matrix is to show which actors perform which roles, supporting the definition of security and skills requirements.	
Diagrams	A model describing the rationale for how an enterprise creates, delivers, and captures value.	

Table 2. 1 List of EA artifacts extracted from the literature review

SRQ2: Which stakeholders benefit from the use of EA artifacts in the strategic planning process?

The various stakeholders are producers of EA artifacts (architects, project managers/members), users (architects, project managers, IT organization, and management), and stakeholders who support and guide the use and production of EA artifacts (IT managers) (Niemi & Pekkola, 2015). According to Kotusev (2019c), senior business leaders and architects are essential stakeholders in the strategic planning phase. Insight into the roles, concerns, and information needs of these stakeholders is thus crucial, and the EA artifacts as information provided are tailored accordingly (Niemi & Pekkola, 2015). EAM processes provide direction and support in the design and management of the EA to support the organizational transformation (van der Raadt & van Vliet, 2007, p.172)."

2.3.2. Conclusions

Based on the above results, the artifacts extracted from the literature review are mission statements, vision statements, scenarios, strategies, goals, initiative measures, principles, policies, business capability models, roadmaps, business models, considerations and visions, matrices, diagrams. The stakeholders involved in the strategic planning process are architects, project managers/ members, IT organization, EA support stakeholders, senior business leaders, planning managers. A clear view on which, how, and by whom EA artifacts can be used to realize its full potential is still little known as stated by Niemi & Pekkola, 2015.

The link between EA and strategic planning in business architecture seems to indicate a gap in EA practice (Simon, Fischbach, & Schoder, 2014). By combining existing competencies with new digital capabilities, new digital technologies such as SMACIT (social, mobile, analytics, cloud, and internet of things) can present both great opportunities but also threats to the value of established companies looking to maintain strong competitiveness (Ross, Sebastian, Beath, Mocker, Moloney, & Fonstad, 2016). Digital technologies do not only require modifying the operational model but also developing and nurturing the organizational capabilities needed to manage digital transformations (Wulf, Mettler, & Brenner, 2017)."

Most articles still focus on the general benefits of EA artifacts in EA practices, which, nevertheless, are essential to carry out EA initiatives in different organizations. However, the role of EA artifacts, their purposes, challenges, and how the various stakeholders use these artifacts for the strategic planning process aimed at digital transformation is little known. Therefore, there is a need to investigate further the role of EA artifacts in a real organizational context.

2.4. Objective of the follow-up research

In preparation for the next stage of the research, a Metaplan session (see appendix H) was organized by the thesis supervisor together with the research team and a Ph.D. candidate, with all having prior knowledge of the topic. The goal was to arrive at a mutual proposed list of EA artifacts used in the strategic

planning process for digital transformations. The session resulted in the following list of EA artifacts as business function development plan, conceptual data model, enterprise portfolio, high-level operational concept, impact and risk assessment, operating model, Principles & guidelines, security & privacy plan, stakeholder communication plan, strategic plan, SWOT analysis, technology & skills forecast, technology standards, governance structure, services and products. The next stage of the empirical research is qualitative research. The purpose is to explore what information was used by whom and when to arrive at a strategic decision for digital transformation ultimately.

3. METHODOLOGY

3.1. Conceptual design

The chapter describes a summary of the overall research methods and design strategy, data collection, and data analysis procedure. The research methodologies are:

- **Literature review**: the first phase of the research uses a systematic literature review method to explore the problem statement from existing studies to answer the research questions. The literature retrieved were from Google Scholar, Open University Online Library, and papers provided by the thesis supervisor. The literature review resulted in an agreed proposed list of EA artifacts by the project team and the stakeholders involved in the strategic planning process for digital transformation (see chapter 2). An explicit description of the role of EA artifacts in the existing literature is still little known. That leads to further exploration of the topic in the next phase of the study.
- **Qualitative research**: in this next phase of the empirical research (exploratory), a single case study method is selected to gain a deep understanding of the role of EA artifact in a practical context. Case study research studies a phenomenon of which the boundaries are not completely clear in its natural environment and gathers information from multiple entities, i.e., the management, employees, or the organization (Benbasat et al., 1987).

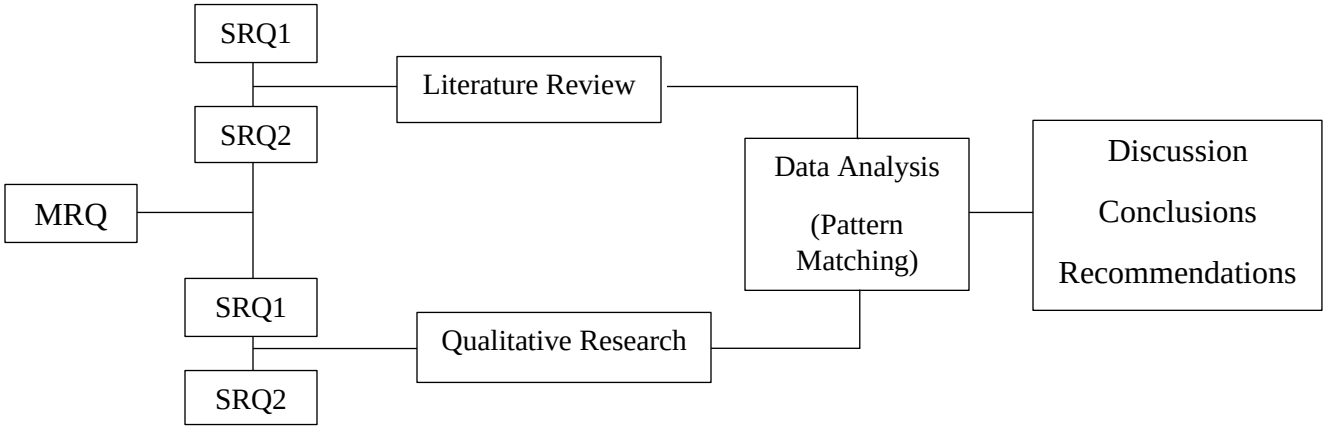

Figure 3. 1 Research Concept Framework

Case study research uses multiple data sources, a strategy that enhances data credibility (Yin, 2013). Potential data sources may include documentation, archival records, interviews, physical artifacts, direct observations, and participant-observation (Baxter, 2008). In this study, interviews are the primary source for gathering information, as suggested by Yin (2013). Case study research needs to fulfill *four* tests (see appendix E) to obtain scientific relevance, common to all scientific methods (Yin, 2013):

(1) *Construct validity*: this ensures the objectivity in this case study, as it is difficult to distinguish between a subjective opinion of the researcher and the objective truth. The use of existing EA documentation to triangulate the collected interview data will fulfill this requirement.

(2) *Internal validity*: this aim at establishing a causal relationship, whereby certain conditions lead to other states, as distinguished from spurious correlations. Internal validity is not relevant to this research because it is exploratory and does not try to find a causal relationship.
(3) *External validity*: the aim is to establish the domain to which a study's findings can be generalized. That is not relevant to this study due to the nature of the research (single qualitative case study).
(4) *Reliability*: this assures that the actions taken during the study can be duplicated, such as data collection methods. All communication gathered through interviews and documentation will be carefully stored in a database. That will ensure the reliability and reproducibility of this case study.

The advantage of an exploratory case study to this research is particularly useful to clarify an understanding of an issue, problem, or phenomenon (Saunders et al., 2009).

3.2. Technical design

3.2.1. Case organization

The case organization is active in health insurance funds. In 2018, IT developments needed to meet the conditions of the sixth state reform and optimal information exchange between different involved parties. The case organization has a market share of 6% and a revenue budget of about €3.09 billion. The case organization has a pyramid structure: at the very top is the National Federation, followed by the health insurance funds and the local offices with over 500 staff.

3.2.2. Data collection

The empirical research use a semi-structured interview method based on an interview guide verified together with the thesis supervisor (see appendix E). EA archival documents were also collected, which adds extra credibility. Three face-to-face interviews held, and two conducted through the phone. The recorded interview length varied from 25 minutes to 35 minutes, lasting an average of 30 minutes. The respondents were business and IT executives to gain a profound understanding of the role of EA artifacts in the strategic planning process for digital transformation (see appendix F). The questions discussed with selected stakeholders available focused on the strategic planning process, EA artifacts used by these stakeholders for digital transformation, and any other relevant matters.

3.3. Data analysis

The interviews were recorded and transcribed from voice to text document using Google Cloud and VB audio virtual software. The coding (open coding) was on an Excel spreadsheet, as suggested by Ose (2016). Every interviewee had a personal identification number. Themes used where derived from the research questions and categorized (see section 1.4) and also given different codes. The data were concatenated and transferred to Word document for analysis (see appendix G). Data were analyzed using pattern matching (see appendix D). According to Yin (2013), pattern matching is most desirable in original case study research (Yin, 2013). Pattern matching involves the specification of a theoretical pattern, the acquisition of an observed pattern, and an attempt to match these two (Trochim, 1989). The advantage of the use of pattern matching is that it does not require measurement of each construct with multiple methods. The disadvantage of using a pattern matching approach is that pattern matching requires a specific theory of the constructs rather be precise.

3.4. Validity and reliability

The study used construct validity to test the validity of the data, as suggested by Yin (2013). I triangulated the documents against their typical use cases that the interviewees described ensuring consistency and triangulation of the findings. This way, the observations are validated from two or more independent sources. To minimizes systematic error or bias results and to examine the extent to which the result of the study relates to other situations outside of the study, it is crucial to address internal and external validity threats to the study (Yin, 2013). Internal and external validity does not apply to this research since it is an exploratory single case study and does not try to find a causal relationship. The recorded interviews were stored in a database to ensure the data is reliable and reproducible.

3.5. Ethical Aspects

I informed the contact person in the case organization up Front that the data to be collected is mainly for education research purposes and not used for commercial purposes. All the interviewees were guaranteed the full confidentiality of the data they provide. Each interviewee provided explicit permission to either record a conversation or took notes during the interview. The interviewees had the chance to opt-out at any point. I discreetly handled the information collected, interviewees, and the name of the organization. I collected documents from the EA repository/ archival documents with permission from the case organization.

4. RESULTS

This chapter covers the outcomes of the case study. The documents (strategic plan, IBM Cognos analytics handbook, project plan) provided by case organization were analyzed and matched against their typical use cases that the interviewees described. The list of interviewees are architects, project managers/ members, IT organization, EA support stakeholders, senior business leaders, planning managers (see appendix F). Themes were formulated (see section 3.3) during the coding and data analysis phases (see appendix G). The empirical research findings are:

The stakeholders are involved in the strategic planning process:

The findings show that the strategic planning process involves internal as well as external stakeholders. The external stakeholders comprise of the National Institute for Health and Disability Insurance (RIZIV), National Federations (Landsbond), and Health Insurance Funds. These organizations are all involved in the strategic planning process.

> *"We have several stakeholders who are involved in the strategic planning process. We have social security projects (RIZIV). We have external stakeholders, socialist mutual insurance (300), Landsbond, health insurance funds." (Interview 1_2)*

Many different organizations have their concerns, which makes it challenging to coordinate the strategic planning process.

> *"There are several external partners, which makes it difficult to coordinate. We are in a special situation as we are not just a normal company." (Interview 2_27)*

Besides senior IT and business executives, the social partners and National Federation each have two or more representatives involved in the strategic planning process.

> *"Our organization works together with different social partners. Each social partner has representatives that benefit from the use of artifacts in decision making and planning. The stakeholders involved in the strategic planning process are ICT directors, architects, IT managers, coordinators (IT and business), senior managers, project leaders, medical directors, and directors (business)." (Interview 4_84)*

The National Federation (Landsbond) stands central between the different social partners in the decision making and provides coordination between all stakeholders.

> *"We work with different partners, each having their representatives that oversee the affairs concerning strategic planning and decision making. The Landsbond is central and responsible for coordination between all stakeholders involved." (Interview 5_113)*

In summary, the case organizations involve representatives from partner organizations internal and external, with each having individual concerns. The Nation Federation (Landsbond) provides coordination, which could be difficult amongst the different partners.

Which EA artifacts exist in the case organization:

EA documents are essential in the strategic planning and presented to the stakeholders in the form of a template (PDF, Excel, and Word) before every strategic planning committee meeting. The intention is for the different stakeholders to work closely the same way using the same template.

> *"We have a template that we get at every meeting to make points, and everything spoken makes a report in a template published in our SharePoint." (Interview 1_8)*

The committee is responsible for providing the documents used in the strategic planning process and also reporting and sharing the information gathered during the committee meetings.

> *"It is the committee that rolls out the documents (template), and from there, the instructions go to various entities, insurance, the national federation of which actions expected to carry out and report and whether it passed or failed, why it failed. The members are the priority. If there is a new flow of data interesting to the members, we need a new data flow plan first. That is always prepared and followed up products developed for digital transformation." (Interview 2_44)*

In the case organization, it seems complicated to know the documents used by the stakeholders since they come from different sources and are not structured using any particular framework making it also difficult to maintain.

> *"I have no idea. We have different partners, and they all use different documentation and software, which makes it difficult to know which documents we use. We often use documentation in our portfolio." (Interview 1_11)*

Documents presented to the stakeholders are consulted regularly and helps the different partners identify which projects to implement first and which ones to put on hold dependent on the client's needs.

> *"Different social partners provide the documents during the strategic committee meetings. Also, during project implementation, the documents are consulted regularly to determine which project implemented within a certain time frame based on importance and relevance to members. Every project implemented has to be reported to the strategic planning committee." (Interview 3_67)*

The documents used in the strategic planning process are most valuable during the initial phase when the organization discusses which projects to develop and also during the implementation phase of the project.

> *"We artifacts or documents during the initial stage while discussing the plan of action and projects but also during the implementation of projects or new products and services. These documents are available in our SharePoint." (Interview 4_98)*

Despite difficulty having a full overview list of EA artifacts, the findings present lists of some EA artifacts used in strategic planning.

> *"We use artifacts like Cognos analytics, portfolio, principles, assessment, manuals. It is difficult to have a specific full list of documents used to decide the strategic plan for our organization." (Interview 3_64)*

> *"PMO working group report, portfolio, and additional documentation published on our SharePoint." (Interview 1_20)*

> *"A strategic plan document is used by both business and IT partners." (Interview 4_111)*

The EA documents received from the different external partners contain different information based on the purpose it is used for by the stakeholders.

> *"The document contains information, for example, about digital workplace, problems with current software, and implementing new projects, the latest migration from Windows7 to Windows10, security, business demand." (Interview 3_74)*

> *"Because we are working with different partners, for every project, there are templates provided by the partners. These templates could be guidelines, instructions, project plans." (Interview 3_75)*

> *"The information in the documents is either plan, report, instructions, assessment, manuals. It depends because we received different documents, and each contains different information." (Interview 4_104)*

> *"The documents contain information, for example, about our plan, information about ongoing projects, infrastructure, the structure of our organization, business plans, software, users' experiences, training, centralization." (Interview 5_135)*

The information contained in these artifacts is used by different stakeholders to carry-out different tasks to facilitate information systems flow and strategic planning decisions.

> *"The documents we receive from the different external social partners are used in the form of reports and manuals to carry out, for example, updates, roll out new services and products, but also as instructions for users." (Interview 4_102)*

> *"I also use documents like strategic plans, goals, principles, and guidelines to understand what is achievable and how. It is important that all projects are well document and stored in our database." (Interview 5_124)*

> *"For me, using a SWOT analysis helps me identify strengths, weaknesses, opportunities, and threats related to our business competition and project planning. Cognos Analytics is a tool for reporting, analytics, balanced scorecard, and monitoring." (Interview 5_132)*

In summary, the case organization uses a wide variety of EA artifacts, ranging from a template for the strategic planning committee to principles. Nonetheless, not all stakeholders seem to be aware of the existence of these artifacts.

How the strategic planning process leads to digitalization:

Most stakeholders play a coordinating role in deciding which projects to follow and which projects held for later.

> *"The planning process requires coordination between the partners, and there are different layers of the strategic process. We have to consider different partners who draw up their schedules. The different layers of strategic planning adjusted with social security (RIZIV) to compile is fairly*

> *difficult for our sector because we are working with different partners who draw their plans." (Interview 1_24)*

The case organization has a strategic planning committee that is responsible for discussing and deciding the next plan of action for the business. The committee decides the decision on products and technology to implement first.

> *"We have a steering committee. The committee makes decisions on the priorities or order of business in our organization and manages the general plan of its operations." (Interview 4_90)*

Clients are central in the decision making to meet their expectations, introduce new products, and improve services.

> *"That is all listed and rotated depending on the data received are required. All other pieces are kept on hold while other pieces continue all in the way that is beneficial for our members." (Interview 2_40)*

> *"Our biggest priority is to serve our customers by offering the best services and using the latest technology. We ensure the customers get their social security allowances paid on time, visit doctors are correctly refunded, and we offer advice concerning their health, and we also offer other services." (Interview 5_116)*

The strategic planning committee meets three to four times a month to discuss the position of new projects and also to review the financial capability of rolling-out projects.

> *"The committee meets every month, and every month there is also a follow-up on the situation of what foreseen was, what we were able to implement, what we were unable to implement, and the reason why it was not possible. We examine the financial side because it is not only the material, but that projects also remain financially affordable." (Interview 2_42)*

All projects discussed during the strategy meetings and the reports are placed in an online archive to make the report available to the stakeholders when needed.

> *"All projects documented, and the report is placed in our SharePoint online. Documents are used in the beginning stage of rolling out a new project and during the implementation of the project." (Interview 3_72)*

> *"The meetings are reported and documented after every meeting and uploaded into our SharePoint. The meetings organized by product owners and architects are in collaboration with senior executives. The decision on projects to follow and can be implemented has to be discussed and decided by the board of directors with human resources. The documents are mostly in Word and Excel formats, making it easier for file sharing." (Interview 5_119)*

In summary, the clients stand central in the strategic planning of the organization. Before implementing each project, we examine the financial aspects, likewise the decision on how beneficial a project is to the clients.

How the case organization perceives digital transformation:

The content of the documents provides the necessary structure needed to achieve digital transformation.

> *"There are structures in the templates that we must use to achieve a digital transformation." (Interview 1_18)*

The case organization tries to introduce new digital technologies to its business model. However, the product line remains unchanged regardless of the technology introduced.

> *"There are no new services and products at the moment. We have been working via SharePoint for a long time. What we have in our SharePoint does what it should do. More and more are moving towards the cloud. Technology can change, but the product always remains the same." (Interview 1_22)*

Implementing new digital technology like the cloud seems challenging for the case organization. The safety of clients' information is a concern for the organization.

> *"We must, of course, also look at the safety of our products towards digital transformation." (Interview 1_25)*

> *"We have already considered going to Cloud, but that makes it even more complicated because we work with medical data, financial data, and the security must be 100%, and that is always a big deal if you are going to work with a customer at last." (Interview 2_49)*

IT development is a priority for the organization to ease information flow amongst the different partners with the introduction of new digital services.

> *"The biggest change in our organization happened in 2018 when we introduced new services like e-certificate, Windows 10, Cognos analytics, shared electronic security files on the secure platform accessible through a hub eHealth. We introduced a new server for Antivirus. Some of the projects, like Cognos analytics by IBM, is still being tested for full functionality. We also recently introduced an online platform where clients could register themselves online on our websites rather than going through all the physical paperwork. We also integrated a barcode system IRIS to easily sort and classify documents online in our database accessible to the users. We introduced a ticket system PLANON for IT. Another change was the introduction of a file system Zensof for the business partners. We are working towards the cloud. The next project is integrating Microsoft 365 into our business." (Interview 5_137)*

The case organization is working towards integrating more Cloud services into the business, which opens opportunities to introduce a new product like Microsoft 365. However, the external partners' interest has to align with that of the organization.

> *"We will have to evolve with the new technologies that are emerging, such as Office 365, but we draw up those plans systematically because we are with various external partners and that we also have to be able to stay nice and quiet." (Interview 2_30)*

> *"A decision regarding the digital workspace is expected in December at VI300. There are two options, namely, keep everything on-premise or use a 365 (cloud) version." (Interview 3_78)*

The case organization have a Datawarehouse were all documents used in the strategic planning process are stored and readily available when needed.

> *"We have a Datawarehouse. All documents used are stored in this database and can be retrieved when necessary. Documents are always placed in our SharePoint, making it accessible to all shareholders involved in the strategic plan." (Interview 5_125)*

In summary, technology is a significant factor in creating digital services for the case organization to ease information flow. The organization faces challenges of implementing new digital technologies into its business model with concerns about the safety of clients' information.

How the case organization practice EA:

The case organization is highly dependent on IT to achieve its business goals. There are no specific individuals or departments responsible for developing EA. Instead, Enterprise architecture integrates into daily business routines.

> *"Our services are highly dependent on the software provided by IT, so we need to have good communication between the business and IT. We are presently working on centralization. By this, we can work more uniformly together with the different partners and also this will help us reduce costs. That involves migrating to Microsoft 365. The decision to move to Microsoft 365 was introduced by the 300 together with the Landsbond and discuss during our meeting. Fully developed Enterprise Architecture practice is not that easy in our sector, especially because we work with different partners, and we all must work uniformly." (Interview 5_141)*

Due to the fusion of four Health Insurance Funds, centralization became necessary to reduce complexity and ease the smooth transition of the business from their current state to their target state. This way, the case organization can save many costs and still retain its business capabilities.

> *"We are also working towards reducing our costs while increasing productivity through centralizing." (Interview 4_88)*

Centralization has to be implemented at all levels and departments of the business, considering the interests of all stakeholders (internal and external partners) involved.

> *"At the level of installation of new products, we must work with social security (RIZIV), policy team, and all specifications that we have spoken based on the supplier who has the products that come to us. We must look at the strategic level that the product meets our expectations and safety before implementation." (Interview 1_13)*

> *"We have to work closely with the Back-office to ensure a smooth transition. The coordination is at the level of the social partners." (Interview 3_82)*

In summary, the case organization does not have a stepwise structure of its EA; instead, EA integrates into the regular business processes. However, the latest business goal to work more central would reduce costs and provide better alignment between its business and IT.

5. DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1. Discussion – reflection

This chapter discusses the findings of the empirical research outcomes in the case organization and its implications for existing studies. First, the main findings on the roles of EA artifacts and their relationship to existing studies. Then, the limitations are analyzed. Finally, conclusion, the recommendation for practice and recommendations for future research are presented, which is of interest to researchers, scholars, and practitioners.

5.1.1. Relationship to existing theories

As demonstrated in the previous chapter (see chapter 2), the current EA literature provides several studies explaining the role of EA artifacts in general and the stakeholders involved. The findings of the empirical research should deepen our understanding of the practical role of EA artifacts in EA practice:

The stakeholders involved in the strategic planning process:

According to Niemi & Pekkola (2015), EA has different stakeholders. The stakeholders are those producing EA artifacts (e.g., architects and projects), those using them (e.g., architects, projects, IT organizations, and management) and those facilitating EA artifact production and usage (i.e., management) (Niemi, 2015). Kotusev (2019c) finds that senior business leaders and architects are essential stakeholders in the strategic planning phase. The list of stakeholders from the existing literature are architects, project managers/ members, IT organization, EA support stakeholders, senior business leaders, planning managers. The findings are in-line with our knowledge from the existing literature. The stakeholders are both internal and external partners, with each having two or more representatives.

> *"We have several stakeholders who are involved in the strategic planning process. We have social security projects (RZIV). We have external stakeholders, socialist mutual insurance (300), Landsbond, health insurance funds." (Interview 1_2)*

> *"The stakeholders involved in the strategic planning process representatives from the Landsbond, RIZIV, health insurances are mostly senior IT managers, support managers, project managers, IT supply organization, coordinators, ICT directors, IT managers, communication director, Front- and Back Office directors, medical director, architects." (Interview 5_114)*

In summary, the findings show that, additionally, to stakeholders mentioned in the existing literature, the research show external partners to be stakeholders for the strategic planning process. That sheds more light on the list of stakeholders involved in the strategic planning process.

Which EA artifacts exist in the case organization:

EA artifacts document components in a consistent way across the entire architecture (Bernard, 2012, p.117). The EA artifacts developed during the strategic planning process are mission and vision statements, scenarios, strategies, goals, and initiative measures (Bernard, 2012, p.85). Based on Kotusev (2019), the strategic planning process revolves around Considerations (e.g., principles and policies) and Visions (e.g., business capability models and roadmaps). TOGAF (2011) classifies artifacts into catalogs (lists of things), matrices (showing relationships between things), and diagrams (pictures of things). In

preparation for the qualitative research, a Metaplan session (see appendix H) was organized by the thesis supervisor together with the research team and a Ph.D. candidate, with all having prior knowledge of the topic. The session resulted in the following list of EA artifacts as business function development plan, conceptual data model, enterprise portfolio, high-level operational concept, impact and risk assessment, operating model, principles & guidelines, security & privacy plan, stakeholder communication plan, strategic plan, SWOT analysis, technology & skills forecast, technology standards, governance structure, services and products. The finding shows some artifacts found in the case organization are the same as the one in the literature with the addition of Cognos analytic.

> *"We use artifacts like Cognos analytics, portfolio, principles, assessment, manuals. It is difficult to have a specific full list of documents used to decide the strategic plan for our organization." (Interview 3_64)*

> *"We mostly receive documents from extern partners like a strategic plan, portfolio, standards and security, analysis. Senior IT/business managers use the documents in our organization. Working with different extern partners means using different documents too." (Interview 4_96)*

> *"For me, using a SWOT analysis helps me identify strengths, weaknesses, opportunities, and threats related to our business competition and project planning. Cognos Analytics is a tool for reporting, analytics, balanced scorecard, and monitoring." (Interview 5_132)*

In summary, the findings present additional artifacts like Cognos analytics, which is a web-based integrated suite that provides a toolset for reporting, analytics, scorecards, and monitoring of events and metrics designed to meet different information requirements in the case organization. Some EA artifacts found in the case organization have different names than the once found in the existing literature.

How the strategic planning process leads to digitalization:

The existing literature defines strategic planning is an unstructured continuous process tightly integrated into general management strategic activities, e.g., environmental analysis, identifying competitive advantages, and goals formation (Kotusev, 2019, p.2). A strategic plan can require various EA's at different points in time of EA transformations, which, in turn, would benefit from the previous knowledge of the products and services to be supported (Lankhorst, 2013). The finding confirms that the strategic planning process requires various information found in EA artifacts are different phases.

> *"The committee meets every month, and every month there is also a follow-up on the situation of what foreseen was, what we were able to implement, what we were unable to implement, and the reason why it was not possible. We examine the financial side because it is not only the material, but that projects also remain financially affordable." (Interview 2_42)*

In summary, EA artifacts play an essential role in the strategic planning process at different phases when the stakeholders determine which projects to roll-out first or suspend, taking into account the financial side of the project.

How the case organization perceives digital transformation:

Based on the existing literature, digital technologies like SMACIT (social, mobile, analytics, Cloud, and Internet of things [IoT]) present great opportunities for established companies by offering new compelling value, especially by combining their existing competencies with new digital capabilities (Ross et al., 2016, p.3). A two-speed IT architecture will help companies develop their customer capabilities at high speed while lowering the release pace cycles of new functionality (Bossert, Ip, & Laartz, 2016). The case organization is working towards integrating new digital technology like Cloud technology into its business model but with concerns about the safety of the technology.

> *"There are structures in the templates that we must use to achieve a digital transformation." (Interview 1_18)*

> *"We will have to evolve with the new technologies that are emerging, such as Office 365, but those are plans that must be systematic because we are with various external partners and that we also have to be able to stay nice and quiet." (Interview 2_30)*

> *"A decision regarding the digital workspace is expected in December at VI300. There are two options, namely, keep everything on-premise or use a 365 (cloud) version." (Interview 3_78)*

> *"We must, of course, also look at the safety of our products towards digital transformation." (Interview 1_25)*

In summary, The case organization depends highly on digital technology to meet the business capabilities but also face the challenges of security threats in integrating new digital technologies into the business since they deal with clients' medical information.

How the case organization practice EA:

In the existing literature, EA is a description of a company from an integrated business and IT perspective aimed to improve business and IT alignment (Kotusev, 2015; Bradley et al., 2011; Tamm et al., 2011). EA is used to provide insight and overview to manage the complexity of an organization and to aid strategic decision making (Op't Land, Proper, Waage, Cloo, & Steghuis, 2009). The case organization does not have a defined stepwise EA structure, but instead, EA integrates into its general management practice in comparison to the existing literature.

> *"Our services are highly dependent on the software provided by IT, so we need to have good communication between the business and IT. We are presently working on centralization. By this, we can work more uniformly together with the different partners and also this will help us reduce costs. The decision to move to Microsoft 365 was introduced by the 300 together with the Landsbond and discuss during our meeting. Fully developed Enterprise Architecture practice is not that easy in our sector, especially because we work with different partners, and we all must work uniformly." (Interview 5_141)*

In summary, despite the absence of a stepwise structure of the EA, the centralization of the business model will bring business and IT alignment closer, which is the benefit of EA in an organization.

5.1.2. Relationship to the proposed list of EA artifacts

In paragraph 2.4, we proposed a list of EA artifacts extracted from the literature review used in the strategic planning process. In the previous studies, we know that after a comprehensive set of EA artifacts are developed, these EA artifacts are often not used actively or even found to be mostly useless for decision-making purposes (Carvalho & Sousa, 2014; Kappelman, 2010). Table 5.1 below highlights an overview list of EA artifacts found in the case organization during the qualitative research in comparison to the list of artifacts found in previous studies. Some artifacts in the literature review (see Chapter 2) were absent in the case organization. At the same time, documents like Impact and risk assessment, security & privacy plan were not available for analysis due to privacy concerns by the case organization.

EA artifacts	EA artifacts present/absent (case organization)	Comments
Business function development plan	Absent	
Conceptual data model	Absent	
Enterprise portfolio	Present	Enterprise portfolio describes the analysis of IT landscape and business capabilities.
High-level operational concept	Absent	
Impact and risk assessment	Present	This document was not analyzed. Describes IT compliance
Operating model	Absent	
Principles & guidelines	Present	Describe the organizations' best practices.
Security & privacy plan	Present	Document not analyzed due to security/privacy concerns.
Stakeholder communication plan	Present	Contains information about who is responsible for what in the organization
Strategic plan	Present	This document contains information about the mission and vision of the organization.
SWOT analysis	Present	This document identifies the strengths, weaknesses, opportunities, and threats related to business competition and project planning.
Technology & skills forecast	Absent	
Technology standards	Absent	
Governance structure	Present	Describes IT governance information
Services and products	Present	This document contains detailed information about the services and

		products available in the organization.
Cognos analytics		It provides a toolset for reporting, analytics, scorecards, and monitoring of events and metrics.

Table 5. 1 Relation to the proposed list of EA artifacts

5.1.3. Limitations of the empirical research

This study has some limitations: the chance of potential subjectivity by reflecting on the views of respondents, the absence of some documents for analysis due to privacy concerns (see section 5.1.2), and the lack of some senior executive managers' contribution due to COVID-19 pandemic. The contribution of more senior executive managers and documents used would add more credibility to the research. The observations during the study to understand the role of EA artifacts questions the established conceptualizations of EA practice.

5.2. Conclusions

In this paper, different approaches used to understand the role of EA artifacts in the strategic planning process for digital transformation. This research provides the answer to the main research question given below are as follows:

- *Which EA artifacts are used by which stakeholders to facilitate the strategic planning process for digital transformation?*

The research presents a list of EA artifacts used and for what purposes. For example, the use of reports and manuals to carry out updates, roll out new services and products, but also as instructions for users. The use of SWOT analysis to analyze the organization's present state and what the organization wants to achieve. Cognos Analytics is a tool for reporting, analytics, balanced scorecard, and monitoring. These documents are most useful during the roll-out of new projects and the implementation of a project for digitalization. Technology plays a significant role in providing digital services for the case organization—a framework not used to structure EA artifacts. The stakeholders involved are representatives from different partners (internally and externally). The study also shows that EA practice hardly described as a single stepwise approach to the role of using different EA artifacts but rather as different business processes that revolve around specific interrelated EA artifacts.

5.3. Recommendations for practice

Firstly, business capability models and roadmaps could provide some high-level descriptions of the organization since both represent long-term goals and alignment for the business and IT.

Secondly, EA practice could be described hardly as a single stepwise approach to the role using different EA artifacts, but rather as different processes that revolve around specific interrelated EA artifacts.

Thirdly, different EA artifacts play a different role in terms of a user case.

Fourthly, different roles of EA artifacts require different stakeholders, which are strongly associated with their intended usage and purpose.

Fifthly, the need to consider the influence of different partners on the roles of EA artifacts in the context of an EA practice.

Lastly, Fast IT can transform business value from any perspective and give it a backbone.

5.4. Recommendations for further research

The findings show that technology is a significant factor in creating digital world services in health insurance funds. The qualitative research provides new insight into the role of EA artifacts as follows: EA artifacts are consulted as needed and contribute to a different aspect of EA practice like decision making, planning, deciding what technology to implement. There are internal as well as external stakeholders involved in the strategic planning process, which plays an essential role in digitalization. Fast IT can transform business value from any perspective. CIO's, business users, and even technology vendors (Cloud, mobility, and big data) can take hold of the traditional model of IT service and give it a backbone. Thus, further research should investigate how the artifacts found in the case organization apply to other sectors. Further research should investigate the role of artifacts from a broader perspective. Also, further research should investigate the benefits and risks of using new digital technologies/ fast IT.

REFERENCES

Abraham, R. (2013). Enterprise architecture artifacts as boundary objects—A framework of properties. In J. van Hillegersberg, E. van Heck, & R. Connolly (Eds.), Proceedings of the 21st European Conference on Information Systems, 1-12.

Ahlemann, F. (2012). Strategic enterprise architecture management. Challenges, best practices, and future developments. New York: Springer.

Aier, S., Kurpjuweit, S., Schmitz, O., Schulz, J., Thomas, A., & Winter, R. (2008). 'An Engineering Approach to Enterprise Architecture Design and its Application at a Financial Service.'

Ambler, S. W. (2010). "Enterprise Architecture: Reality Over Rhetoric." Dr. Dobb's Journal Retrieved 4 May 2014. Retrieved from http://www.drdobbs.com/architecture-and-design/enterprisearchitecture-reality-over-rhe/224600174

Armour, F., Kaisler, S. H., & Liu S. Y. (1999a). A Big-Picture Look at Enterprise Architectures. IT Professional. 1(1), 35-42. doi:10.1109/6294.781623.

Baxter, P., & Jack, S. (2008). Qualitative case study methodology. The Qualitative Report, 13(4), 544-559. Retrieved from http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The Case Research Strategy in Studies of Information Systems. MIS Quarterly, 11, 369-386. http://dx.doi.org/10.2307/248684

Bernard, S. A. (2012). An Introduction to Enterprise Architecture (3rd ed.). Bloomington, IN, AuthorHouse.

Bischoff, S., Aier, S., & Winter, R. (2014). Use It or Lose It? The Role of Pressure for Use and Utility of Enterprise Architecture Artifacts. DOI: 10.1109/CBI.2014.56.

Björn, K., & Roth, S. (2014). Federated Enterprise Architecture Model Management: Collaborative Model Merging for Repositories with Loosely Coupled Schema and Data.

Blomqvist, S., Halén, M., & Helenius, M. (2015). Connecting Enterprise Architecture with Strategic Planning Processes, IEEE 17th Conference on Business Informatics, DOI 10.1109/CBI.2015.39 `

Bossert, O., Ip, C., & Laartz, J. (2016). Deploying a two-speed architecture at scale, McKinsey Digital.

Bradley, R. V., Pratt, R. M., Byrd, T. A., & Simmons, L. L. (2011). The Role of Enterprise Architecture in the Quest for IT Value. MIS Quarterly Executive. 10(2), 73-80.

Brereton, P., Kitchenham, B., Budgen, D., and Li, Z. (2008). 'Using a protocol template for case study planning.' Proceedings of EASE.

Buckl, S., & Schweda, C. M. (2011). On the State-of-the-Art in Enterprise Architecture Management Literature. Tech. Rep, Technology University Munich.

Byrd, T. A., Lewis, B. R., & Bryan, R. W. (2006). 'The Leveraging Influence of Strategic Alignment on IT Investment: An Empirical Examination Information & Management,' 43(3). doi:10.1016/j.im.2005.07.002.

Carvalho, J., & Sousa, R. D. (2014). "Enterprise Architecture as Enabler of Organizational Agility - A Municipality Case Study," McLean, E., Watson, R. and Case, T. (eds.)

Darvish, Rouhani, B., et al. (2008). Presenting a framework for agile enterprise architecture. IEEE.

Dube, M. R., & Dixit, S. K. (2011). Comprehensive measurement framework for enterprise architectures, International Journal of Computer Science, and Information Technology. 3(4), 71–92.

Fink. (2005). 'Conducting research literature reviews: From the internet to paper (2nd ed.).' Thousand Oaks, California: Sage Publications.

Fischer, R., Aier, S., & Winter, R. (2007). 'A Federated Approach to Enterprise Architecture Model Maintenance.' Enterprise Modelling.

Given, L. M. (2008). The SAGE encyclopedia of qualitative research methods (Vols. 1-0). 'Thousand Oaks,' CA: SAGE Publications, Inc. doi: 10.4135/9781412963909.

Haki, M.K. (2011). 'A model and empirical test of information technology strategy success,' Int. J. Information Systems and Change Management, 5(1), 54–75.

Hendrickx, F. (2015). Twenty Years Bosman Case. European Labour Law Journal, 6(3), 188–189. https://doi.org/10.1177/201395251500600301

Kaisler, S., Armour, F., & Valivullah, M. (2005). Enterprise Architecting: Critical Problems.. 10.1109/HICSS.2005.241.

Kappelman, L. A. (2010). 'The Pioneers of Enterprise Architecture: A Panel Discussion, Kappelman, L. A. (ed.), The SIM Guide to Enterprise Architecture, Boca Raton.' FL: CRC Press, 9-26.

Kitchenham, B. A., & Charters, S. (2007). 'Guidelines for Performing Systematic Literature Reviews in Software Engineering. Department of Computer Science University of Durham, UK.'

Kotusev, S. (2017). Eight Essential Enterprise Architecture Artifacts Retrieved from http://www.bcs.org/content/conWebDoc/57318

Kotusev, S. (2017b). "Critical Questions in Enterprise Architecture Research," International Journal of Enterprise Information Systems, 13(2), 50- 62.

Kotusev, S. (2018). 'Enterprise Architecture and Enterprise Architecture Artifacts: Questioning the Old Concept in Light of New Findings,' 34(2), 102-128, DOI: 10.1177/0268396218816273.

Kotusev, S. (2019). Exploring the Roles of Different Artifacts in Enterprise Architecture Practice.

Kotusev, S., Singh, M., & Storey, I. (2015b). Investigating the usage of enterprise architecture artifacts. In J. Becker, J. vom Brocke, & M. de Marco (Eds.), Proceedings of the 23rd European Conference on Information Systems, 1-12.

Kotusev, S., Singh, M., & Storey, I. (2017). 'A Frameworks-Free Look at Enterprise Architecture, Journal of Enterprise Architecture,' 13(1).

Labusch, N., Aier, S., & Winter, R. (2014). 'A Reference Model for the Information-Based Support of Enterprise Transformations.' 194-208.

Labusch, N., Koebele, F., Aier, S., & Winter, R. (2013). 'The Architects' Perspective on Enterprise Transformation: An Explorative Study.' 106-124. 10.1007/978-3-642-38774-6_8.

Lankhorst, M. (2013). 'Enterprise Architecture at Work: Modelling, Communication, and Analysis (3rd ed.),' Berlin: Springer.

Löhe, J., & Legner, C. (2014). 'Overcoming Implementation Challenges in Enterprise Architecture Management: A Design Theory for Architecture-Driven IT Management (ADRIMA), Information Systems and e-Business Management,' 12(1), 101-137.

Matt, C., Hess, T., & Benlian, A. (2015). Digital Transformation Strategies. Business & Information Systems Engineering. 57. 339-343. 10.1007/s12599-015-0401-5.

Niemi, E., & Pekkola, S. (2015). Using enterprise architecture artifacts in an organization. Enterprise Information Systems, DOI: 10.1080/17517575.2015.1048831.

Niemi, E., & Pekkola, S. (2019). 'The Benefits of Enterprise Architecture in Organizational Transformation.' https://doi.org/10.1007/s12599-019-00605-3

Okoli, C. & Schabram, K. (2010). 'A Guide to Conducting a Systematic Literature Review of Information Systems Research.' SSRN Electronic Journal. 10. 10.2139/ssrn.1954824.

Okoli, C. (2015). 'A Guide to Conducting a Standalone Systematic Literature Review. Communications of the Association for Information Systems,' 37(43), 879–910.

Op 't Land, M., Proper, E., Waage, M., Cloo, J., & Steghuis, C. (2009). Enterprise Architecture: Creating Value by Informed Governance. Berlin: Springer. ISBN: 978-3-540-85231-5

Ose, S. (2016). Using Excel and Word to Structure Qualitative Data. Journal of Applied Social Science. 10. 10.1177/1936724416664948.

Raadt, B., Bonnet, M., Schouten, S., & Vliet, Hans. (2010). The relation between EA effectiveness and stakeholder satisfaction. The Journal of Systems and Software. 83, 1954-1969. 10.1016/j.jss.2010.05.076.

Radeke, F. (2011). 'Toward Understanding Enterprise Architecture Management's Role in Strategic Change: Antecedents, Processes, Outcomes.' Wirtschaftsinformatik, 16(18), 1-11.

Rahimi, F., Gøtze, J., & Møller, C. (2017). Enterprise Architecture Management: Toward a Taxonomy of Applications, DOI: 10.17705/1CAIS.04007.

Ross, J. W., Sebastian, I., Beath, C., Mocker, M., Moloney, K., & Fonstad, N. (2016). "Designing and executing digital strategies."

Roth, S., Matheus, H., Felix, M., Dominik, M., & Florian, M. (2013). 'Facilitating Conflict Resolution of Models for Automated Enterprise Architecture Documentation,' 1-11.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Research Methods for Business Students. 7th Edition, Prentice-Hall, Harlow.

Sebastian, I., Ross, J., Beath, C., Mocker, M., Moloney, K., & Fonstad, N. (2017). How big old companies navigate digital transformation.

Seppanen, O. (2009). 'Empirical Research on the Success of Production Control in Building Construction Projects.'

Simon, D., Fischbach, K., & Schoder, D. (2013). 'Enterprise architecture management and its role in corporate strategic management,' DOI 10.1007/s10257-013-0213-4

Song, M., Im, S., van der Bij, H., & Song, L. Z. (2011). 'Does strategic planning enhance or impede innovation and firm performance? The Journal of Product Innovation Management,' 28(4), 503-520. https://doi.org/40-5885.2011.00822.x

Tamm, T., Seddon, P., Shanks, G., & Reynolds, P. (2011). 'How does enterprise architecture add value to organizations? 28(1), 141–168.

TOGAF. (2011). "TOGAF Version 9.1", The Open Group.

TOGAF. (2018). "TOGAF Version 9.2", The Open Group.

Trochim, W. (1989). Outcome pattern matching and program theory. Evaluation and program planning, 12(4), 355-366. `

Trochim, William, M. K. & Rhoda, L. (1986). "Conceptualization for planning and evaluation," Evaluation and Program Planning, 9 (4), 289-308.

Van 't Wout et al. (2010). The Integrated Architecture Framework Explained. Why, What, How. DOI 10.1007/978-3-642-11518-9_2

Van der Raadt, B., Slot, R., & van Vliet, H. (2007). Experience report: Assessing a Global Financial Services Company on Its Enterprise Architecture Effectiveness. Proceedings of the 40th Hawaii International Conference on System Sciences, Big Island, 1-10.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda, The Journal of Strategic Information Systems. 28. 10.1016/j.jsis.2019.01.003.

Webster, J., & Watson, R. T. (2002). 'Analyzing the past to prepare for the future: Writing a literature review.' MIS Quarterly, 26(2).

Winter, R., and Fischer, R. (2006). 'Essential Layers, Artifacts, and Dependencies of Enterprise Architecture.' *2006 10th IEEE International Enterprise Distributed Object Computing Conference Workshops (EDOCW'06)*, Hong Kong, China, 30-30, doi: 10.1109/EDOCW.2006.33

Wohlin, C., Runeson, P., Höst, M., Ohlsson, M. C., Regnell, B., & Wesslén, A. (2012). Experimentation in software engineering. Springer Science & Business Media.

Wulf, J., Mettler, T., & Brenner, W. (2017). 'Using a Digital Services Capability Model to Assess Readiness for the Digital Consumer.' MIS Quarterly Executive, 1-25.

Yin, R. K. (2013). Case Study Research. Design and method, Sage publications.

APPENDIX A: Literature review guideline

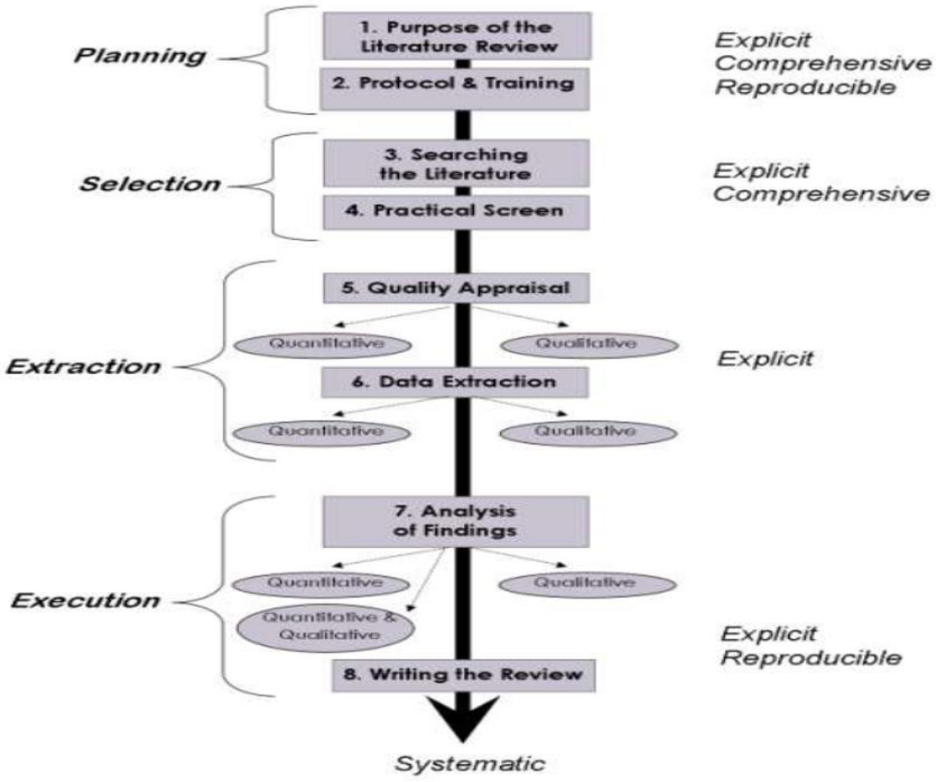

Figure 2. 1 A systematic guide to literature review (Okoli and Schabram, 2010)

APPENDIX B: Selection of relevant publications

Electronic databases/ Other sources	Papers found	Candidate	Publications relevant to the research questions
Google Scholar	407	14	5
OU Library	53	12	1
Open University	19	8	5
Total	**479**	**34**	**11**

Table 2. 2 Relevant publications found (literature review)

APPENDIX C: Data extraction

Articles (Author/ year)	Summary	Important results/findings	Research method	Relevant quotes
Niemi, E., & Pekkola S. (2015).	EA artifacts are supposed to be beneficial for an organization. There are different stakeholders in EA practice, but the primary users of EA artifacts are project architects and managers, and EA team members.	In the case organization, most EA artifact use took place at the project level. The main actors were project architects and EA team members, with relatively few references to management and IT line organization. The architects usually facilitated the use of EA products by the non-architect stakeholders through coaching and training. The use of different kinds of EA artifacts is the most important antecedent for EA benefit realization (Tamm et al. 2011, 149–150).	Case study	EA has several different stakeholders (Niemi, 2007). They are those producing EA artifacts (e.g., architects and projects), those using them (e.g., architects, projects, IT organization, and management) and those facilitating EA artifact production and usage (i.e., management) (Niemi 2007).
Radeke, F. (2011).	Enterprise architecture management (EAM) serves as a tool for guiding organizational change and transformation toward a strategic target state. The role of EAM research also highlights the EAM team's	The need for tight integration of EAM in existing strategic planning and implementation processes, such as roadmap planning and project portfolio management is a prerequisite for seeing benefits from EAM implementations.	Case study	Enterprise architecture management (EAM) is a means to arrive at organizational forms. That allows for timely reconfiguration and to guide strategy-aligned change.

	responsibility for developing, updating, and communicating EA standards at all architectural levels.	Organizations that apply EAM for strategic change need to maintain transparency in terms of up-to-date EA documentation as well as standard transparency of documented and regularly updated standards.		Successful implementation requires managers to cooperate during the entire planning and implementation cycle. IT has increased strategic relevance, and its role as a digital option enabler of digital business strategies make this need even more critical. The often-emphasized role of EAM as a tool for guiding organizational change and transformation toward a strategic target state inevitably situates this discussion in the domain of strategic change.
Niemi, E., & Pekkola, S. (2018).	EA planning and activities integrate with the strategic, business, and IT planning processes of the organization. EA products and services in use by EA stakeholders, such as architects, projects, and management, can be beneficial.	EA planning, documentation, and governance contribute to understanding the organization and its components, thus providing a basis for decision making and development. That seems to be a solid basis for EA work, with appropriate EA tools and frameworks, adequate	Case study	EA covers an organization's business capabilities, business processes, information, IS, and technical infrastructure, and facilitates the integration of strategy, personnel, business, and IT.

		resourcing, and stakeholder participation. EA products are the outputs of processes like documentation and services. These architectural models, standards, principles, and other items are describing the organization's business, information, IS, and technology, on levels of abstraction for varying needs (Aier 2014; Boh &Yellin 2007; Tamm et al. 2011). Utilizing EA products and services by stakeholders, such as architects, projects, and management, is another way EA benefits. The use situations are project and solutions planning, IT and business decision-making, training, and further EA planning.		EA management operations provide direction and support in the design and management of the EA to support the organizational transformation (van der Raadt and van Vliet, 2008). EAM and EA processes include EA planning, which deals with decisions about the EA target state, documented in new and existing EA documents.
Ross, W., Sebastian, M., Beath, C., Mocker, M., Moloney, K., & Fonstad, N. (2017).	Digital technologies are changing how business is an organization of the business. Due to the accessibility of digital technology, small companies have more advantages in implementing new applications. SMACIT	A digital strategy guides leaders to create new value by combining their existing capabilities with capabilities enabled by SMACIT and other digital technologies. These are not merely technology strategies. Instead, they are	Case study	New digital technologies, mainly what we refer to as SMACIT (social, mobile, analytics, cloud, and Internet of things [IoT]) present both game-changing opportunities and

	is one of the latest accessible digital technology. A digital solutions strategy transforms a company's business model.	business strategies that incorporate the opportunities that the digital economy presents. Research on digital transformation is currently limited to identifying trends that signal improved capabilities to apply SMACIT and other technologies, and to the growing accessibility of electronic data to enrich products, services, and customer relationships. Companies needed to adopt both an operational backbone and a digital services backbone to deliver the efficiency, reliability, speed, and agility that the competitive environment was demanding. New technology like SMACIT (social, mobile, analytics, cloud, and internet of things) and other technologies present great opportunities for companies to offer new, compelling value, especially by combining their existing competencies with new digital capabilities.		existential threats to big old companies.

		Companies that fail to adopt new technologies and fail to heed the need for digital transformation are likely to be left trailing behind in the dust.		
Blomqvist, Halén, & Helenius. (2015).	EA plays a crucial role in different stages of the strategic planning process, which can benefit an organization. The findings also suggest that EA and the strategic planning process are case-specific.	EA is most valuable to the strategic analyses in the strategy formulation phase and the strategy implementation phase for transforming the chosen strategy into actions. Currently, the existing literature is to validate the empirical research in the area between strategic management and EA, enabling the strategic digital transformation. More empirical studies of how EA link to strategic planning is required in this area to create larger samples that could result in broader generalizations. EA could bring the most value to the strategic analyses in the strategy formulation and implementation phase for translating the chosen strategy into actions. The implementation of a continuous business-oriented	Case Study	The business environment is changing faster. Successful navigation requires both business agility and capability to govern strategy-driven business transformation. Enterprise Architecture (EA) is an approach for insight and overview to manage the complexity of an organization and to aid strategic decision making.

		EA work failed to gain traction in the organization. The challenging thing was a lack of understanding of the framework as a high-level construct of the business model. The finding emphasizes the need for taking care of social aspects in transformation, not just on the construction of the model. EA more attached to strategic planning and business transformation. The lack of focus on business architecture seems to indicate a gap between EA and strategic planning.		
Vial, G. (2019).	Digital technology like SMACIT (social, mobile, analytics, cloud, and the internet of things – IoT.) applies to infrastructures can to various domains. IT platforms enable the redefinition of existing markets. Digital technology, on its own, has no value except in a specific context.	Organizations use digital technologies to change value creation they have previously relied upon to remain competitive. Digital technologies (like SMACIT) have an impact on the behavior of consumers who have access to information and communication capabilities (like using social media on a mobile device). These technologies become active participants in a dialogue that takes place between	Case Study	Organizations argue that firms must find ways to innovate with technologies by devising strategies that embrace the implications of digital transformation and better operational performance.

	As digital technologies provide more information, computing, communication, and connectivity, they enable new collaboration among distributed networks. They create dependencies among actors whose interests may not fully be aligned. This new reality offers potential for innovation and performance and extends the boundaries to affect individuals, industries, and society. At the same time, it renders firms' ability to sustain their competitive advantage more fragile than ever as they control fewer elements of their operating environment.	an organization and its stakeholders. Bharadwaj et al. (2013) suggest that digital technologies call researchers to study the fusion between strategy and IS (e.g., Kahre et al., 2017) rather than their alignment. They offer digital business strategy formulated and executed by using digital resources to create differential value. Matt et al. (2015) suggest the DT strategy (DTS) to focus on the transformation of products, processes, and aspects owing to new technologies. Digital business strategy is a blueprint that supports companies in governing the transformations owing to the integration of digital technologies after a transformation." Organizational leaders must work to ensure that organizations develop a digital mindset while being capable of responding to the disruptions with the use of digital		

		technologies (Benlian and Haffke, 2016; Hansen et al., 2011).		
Simon, D., Fischbach, K., & Schoder, D. (2013).	The possible breakdown of strategy into a business model for designing the future business execution was one of the main benefits associated with EA (and our underlying business architecture framework) incorporate strategically management, which provides vital support for the three established framework layers.	A SWOT (strengths, weaknesses, opportunities, threats) matrix (Bernard 2009) maybe created as a specific view that provides immediate input for strategy formulation. Capability heat maps (Keller 2009) can be used to detail capability types such as strategic and necessary capabilities (Brits et al. 2007), or visualize hot spots within the capability landscape (e.g., capabilities with disproportionally high costs). The degree of transformation that depends significantly on the complexity of current business execution and the underlying IT landscape (Mocker 2009; Simon et al., .2010). EA makes complexity visible and manageable (Schekkerman 2004; Simon et al. 2010), which allows for transparency as regards	Case study	EA management captures all processes, methods, tools, and responsibilities needed to build a holistic and integrated view of the enterprise and allow for a continually aligned steering of business and IT (Matthes et al. 2008; Niemann 2008). EA activities seem to be concerned most often solely with the documentation of ‘‘operational’’ business elements for IT alignment purposes rather than with real business engineering, that is, the method- and model-based construction of enterprises (Winter 2003) up to a strategic level. As such, EA is deemed to remain stuck in the IT environment.

		transformation readiness and the measures necessary to enable transformation.		
Nowakowski, E., Farwick, M., Trojer, T., Häusler, M., Kessler, J., & Breu, R. (2019).	EA planning is one of the core processes of EAM, and it aims at planning IT transformations aligned with the overall strategy of an organization.	Matt et al. (2015) concluded that it is necessary to derive the transformation strategy out of the digital business strategy. The transformation strategy consists of organizational and technological principles for the implementation of the transformation (Goerzig and Bauernhansl, 2018). Zimmermann et al. focus on the transformation of EA for the IoT, architectural decision making for digital transformations, and the evolution of EAs (Zimmermann et al., 2016, 2015b, 2015a). However, the authors mainly discuss the improvement of decision-making. They do not elaborate on techniques that help practitioners to model and plan target architectures in the context of IoT or I4.0.	Case study	Industry 4.0 changes the industry significantly. For companies to stay in the competition, they need to develop new business capabilities and models that are enabled by Industry 4.0 concepts. However, companies currently struggle with expensive and risky IT transformation projects that are needed to implement such concepts. According to TOGAF (The Open Group, 2011).

Kotusev, S. (2019).	Strategic Planning Process revolves around considerations and visual artifacts. Strategic Planning process takes essential factors of the business environment (like shifting customer preferences, new business opportunities, and competitor actions) as an input. It converts them into high-level strategic plans for IT reflected in considerations and visions, which launch new IT initiatives (i.e., spawn new instances of the Initiative Delivery process). It also provides strategic directions and requirements guiding the technology optimization process.	The Strategic Planning Process revolves around Considerations (e.g., principles and policies) and Visions (e.g., business capability models and roadmaps) artifacts. The goal is to articulate the long-term future course of action for IT by answering the questions: "How is the business environment changing, and how to react to these changes?" Organizations often run the Strategic Planning process covering the whole business. Analysis of successful EA practices today never follows the steps of TOGAF, ADM, EAP, or any other similar stepwise models, even if included in the official list of TOGAF users provided by The Open Group.	Case study	The practice of enterprise architecture (EA) implies specific processes for translating abstract business strategies into concrete information systems supporting these strategies. Widely known process models of an EA practice include the early Enterprise Architecture Planning (EAP) "wedding cake" model1 and the modern TOGAF Architecture Development Method (ADM).
Haki, M.K. (2011).	The involvement of senior managers, CIO, and top executives concerning the strategic planning process and IT is essential.	Senior management involvement in IT/ISSP means that top executives champion this project (Basu et al., 2002), which shows	Survey	Organizations are looking for IT solutions for their business and meet the needs of an overly competitive landscape. Successful implementation IT strategy,

	IT strategic planning effectiveness is a function of strategic alignment, organizational commitment, environmental assessment, IS maturity, and the CIO/CEO relationship.	their commitment as well as the importance of the project. An IS/IT strategic planning team that consists of business managers IS managers, user managers, and unit managers can help the organization to achieve consensus through effective communication and interaction and achieve their IS decision-making goals (Pai, 2006). Cooperative organizational factors influence IT strategic planning success indirectly through the effect on strategic alignment. IT strategic planning effectiveness is a function of strategic alignment, organizational commitment, environmental assessment, IS maturity, and the CIO/CEO relationship. Furthermore, strategic alignment is a function of senior management involvement, team involvement, and the CIO/CEO relationship.		then, is the key. Despite the growing number of IT strategic frameworks, organizations still fail. The main reason for this failure is the organizations' tendency to emphasize the technical and technological aspects while neglecting the organizational (non-technical) factors of IT strategy.

Wulf, J., Mettler, T., & Brenner, W. (2017).	Some managers of digital transformation initiatives used the model by asking what they could learn from the experiences of others in different organizational contexts. A fundamental premise of this approach is that organizations can avoid mistakes already made by others and can benefit from accumulated exceptional experiences identified by applying the capability model.	Managers of digital transformation initiatives, particularly executive managers and digital strategists, use the model to inspire their organization through the lessons learned from and experiences of other organizations.	Case study	Accepting digital technologies not only requires modifying a company's operational model but also developing and nurturing the organizational capabilities needed to manage digital transformations. The transformational capabilities needed are multi-faceted and involves a "digital-first" mindset, digitized practices, empowered talent, data access, and collaboration.

Table 2. 3 Literature review synthesis matrix (data extraction)

APPENDIX D: Pattern matching method

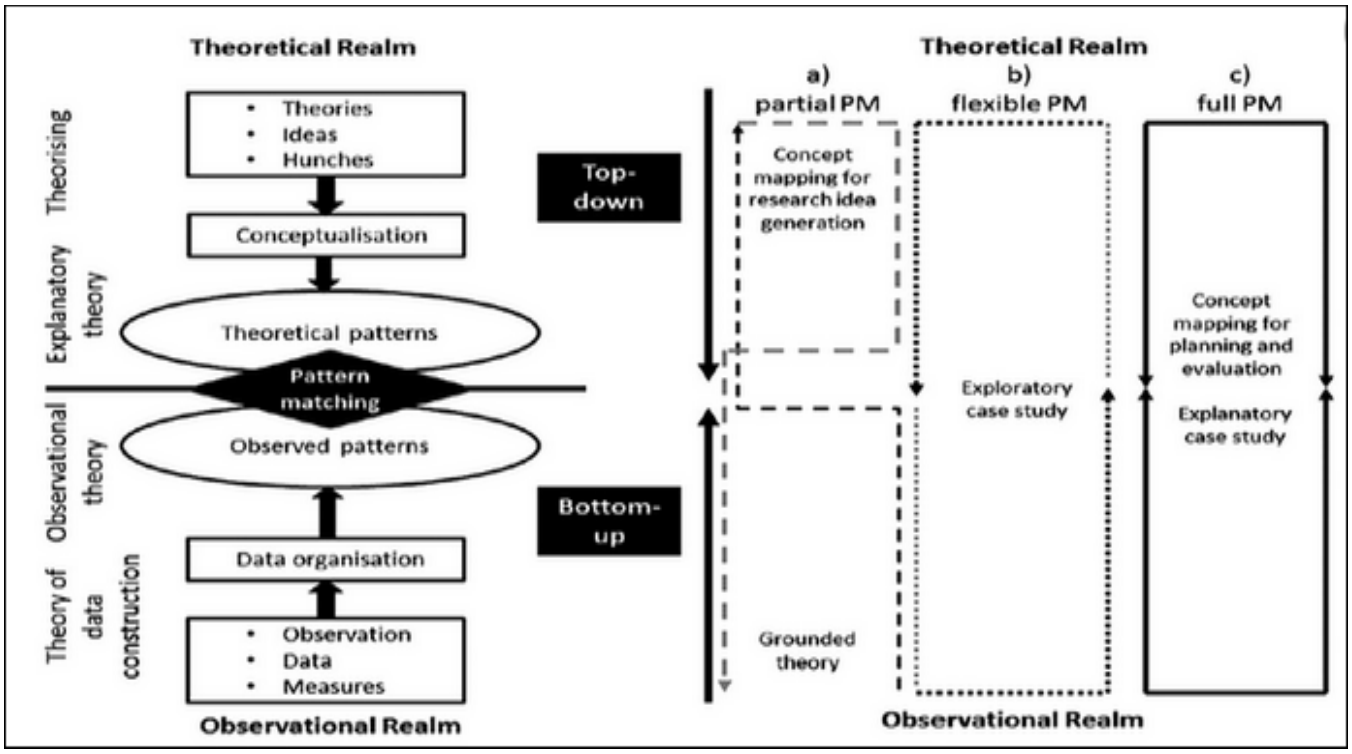

Figure 4. 1 General logic pattern matching (Trochim, 1989)

APPENDIX E: Interview guide

See attachment 1

APPENDIX F: List interviewees

Interviewees	Role (business/ IT)	Position
Interviewee 1	IT	ICT director
Interviewee 2	IT	IT manager
Interviewee 3	IT	IT coordinator ICT/ programming
Interviewee 4	IT	IT coordinator website
Interviewee 5	IT/ Business	Project manager

Table 4. 1 Interviewee selection list

APPENDIX G: Coding and data analysis

See attachment 2

APPENDIX H: Metaplan session (EA artifacts)

See attachment 3